3 December 2019

From: CDR Jamie French, USN, Commander Naval Air Forces (N455)
To: U.S. Department of Transportation Federal Aviation Administration

Subj: Title 14 Code of Federal Regulations Part 91.209 Exemption Request

Encl: (1) List of Military Operating Areas for 14 CFR 91.209 deviation

1. The United States Navy and United States Marine Corps request an exemption from Title 14 Code of Federal Regulations (14 CFR) Part 91 Section 209, *Aircraft Lights*, (a) (1) and (b) to conduct lights-out operations in specific Military Operations Areas (MOA) close to USN installations. This request mirrors FAA Exemption 7960I requested by the United States Air Force keeping in place all previously FAA approved safety measures within exemption 7960I.

This request supports a vital training requirement within Naval/Marine Aviation to increase current levels of lights-out Night Vision Device (NVD) training from low to medium altitudes. By conducting lights-out training prior to actual combat, pilots have an opportunity to achieve the confidence, proficiency and situational awareness needed to be successful in combat. We need a solution that permits this vital training to occur within accessible airspace so Navy pilots can "train as they fight." As a military service and a nation, we must ensure our forces train safely and wisely, but in an operationally relevant environment.

The requirement to train lights out is rooted in the incompatibility between external aircraft lighting and NVD technology, the vast majority of NVD training requires NVD compatible, reduced or extinguished external lighting. Current federal regulations and FAA exemption 7960I permit reduced, or lights-out training in restricted areas, warning areas, and FAA exemption 7960I approved MOA's. The USN requirement for lights-out training provides an allowance for additional MOA's close to USN training areas due to a number of factors.

1. Restricted airspace is either inaccessible to most units or limited due to competing demands. Additionally the relatively small size of many restricted areas makes them unusable for significant NVD training.
2. For Special Use Airspace (SUA) flying units' may have considerable geographic separation from SUA; airspace conflicts or inclement weather. While coastal warning areas are larger in size and close to many USN/USMC facilities they provide limited returns due to a lack of terrain relief and horizon.
    a. The limited lack of return from these coastal warning areas is related to the NVD requirement for reflected energy in order to function. Terrain is of great importance when employing with NVDs, in that terrain reflects energy. That reflected energy creates what is called "albedo" when it interacts with terrain. Albedo is the comparison of reflective properties of different objects within a particular scene. The different reflective properties of various objects create contrast and detail within the scene. Therefore, the more varied the terrain, the more albedo differences within a scene creating a more accurate image for the NVDs. The lack of albedo in many of these overwater warning areas, seriously impacts the overall effectiveness of NVD operations. Similarly, a lack of terrain also lends itself to a lack of horizon, which in any flying environment is always more challenging and potentially hazardous.

3. Experience has shown that we can expect the air battle to take place over varied terrain, whether mountainous, desert, or overwater our crews must train in realistic environments.

As the Department of Defense continues to procure 5th generation fighter aircraft, a greater emphasis is placed on lights-out training. 5th generation aircraft rely on managing aircraft signature (to include visual signature at night) as a fundamental tactic. In order to enable 5th generation fighter training at night, the ability for lights-out training is a requirement. Over the last 5 years, the USN/USMC has determined that professional adversaries are unable to "ignore the lights" in an effort to attempt to replicate a lights-out intercept. Without the ability to train lights-out, our nation's resources are being invested in aircrew that cannot properly train at night.

With the above in mind, the USN is requesting relief from 14 CFR Part 91 Section 209 to conduct NVD lights-out training in the selected MOAs within enclosure (1). This request applies to USN /USMC active duty, and USN/USMC Reserve aircrew. Application of the proposed exemption to lights-out NVD training in selected MOAs, within the lower-48 contiguous United States-will adhere to the following restrictions:

a) Operations under this exemption will be conducted within MOAs published in DoD FLIP, AP/1A, FAA Order 7400.8 and in accordance with "times of use" criteria.

b) All operations will be conducted under the procedural requirements of a Letter of Agreement (LOA) between the flying unit and the Air Traffic Controlling Agency having jurisdiction over the MOA. The LOA must include the following provisions:
   (1) The geographical boundaries, altitude restrictions, and name of the MOA in which operations under this exemption are authorized.
   (2) Reasons and procedures to immediately terminate lights-out/covert lighting configurations and return aircraft external lighting to normal configuration IAW 14 CFR Part 91 Section 209 and USAF instructions.
   (3) Lost communication procedures.
   (4) Loss of radar contact procedures (when applicable).
   (5) Establish non-radar procedures when not in a radar environment.
   (6) The type aircraft and units authorized to conduct NVG operations under this exemption.
   (7) Notification procedures to advise the controlling Air Traffic Facility on activation and termination of lights-out activities.

c) As part of a unit's midair collision avoidance program, each unit safety office, with coordination from unit tactics and training offices, will ensure all airfields and other flying operations within a 50-mile radius of a selected MOA used for lights-out training are thoroughly briefed on all aspects of the operation. Units sharing the use of selected MOAs for lights-out training may combine their efforts.
d) A NOTAM will be issued 24 hours prior to any operations under this exemption. Additionally, a message will be place on the unit's local automatic terminal information service (ATIS), advising listeners of the time and place of lights-out operations.
e) Aircraft equipped with onboard sensors will clear training airspace prior to initiating lights-out operations. Military radar units/radar approach control (MRU/RAPCON) controllers, when available, will monitor the MOA boundaries and immediately advise all participants when a non-participating aircraft has entered. If a non-participating aircraft enters the

airspace all participants will immediately restrict their operations as necessary to ensure the safety of the non-participant.

f) Units will ensure the airspace manager of a particular MOA to be used for lights-out training submits a publication change to VFR sectional charts posting an advisory to non-participating aircraft which states the potential for lights-out operations in the MOA. Additionally, the advisory will recommend contacting local FSS to determine whether or not the MOA is scheduled or active with lights-out training.

IAW (14 CFR) Part 11, the following justifications are also submitted for FAA consideration:

a) *Why is this exemption in the public interest*? The mission of Naval Aviation is to support US Naval Forces by maintaining command of the seas. Relevant, agile technologies that provide a clear military advantage are the keys to deterrence, readiness, and Naval Aviation mission accomplishment. NVDs are an example of these technologies and, to be used effectively in conflict, they must be used realistically in training.

b) *What is the equivalent level of safety*? In designated MOAs, the equivalent level of safety is provided through a variety of conditions that when executed in concert will increase the level of safety for all NAS users.

1) The following measures will ensure that non-participating aircraft are provided with preflight and en route notification of lights out activities:

- A NOTAM will be issued 24 hours prior to all lights-out operations ensuring that during the course of flight planning all NAS users will be provided information on the time and place of lights-out operations in selected MOAs.
- Advisories posted on VFR Sectional Charts with lights-out operations information and reminders to check with the appropriate FSS for NOTAMs should enhance the awareness of non-participants with regards to where and when lights-out operations may be expected.
- Providing informational briefs to local flying organizations will increase lights-out operations awareness and facilitate effective communications between USN/USMC units and local airfields or flying operations.
- Local ATIS advisories will provide additional notification of lights-out activities to transient aircraft.

2) The following provisions will ensure that non-participating aircraft are afforded the opportunity to see and avoid participating aircraft at distances greater than those currently required by Federal Aviation Regulations:

- For those aircraft equipped with onboard radar, sweeping the area with these radar systems will ensure that no non-participating aircraft are within the MOA boundaries prior to commencement of NVD operations and will provide warning of any aircraft approaching the MOA. On detection of a non-participating aircraft, participants will immediately restrict lights out operations.
- The use of ground radars (MRU/RAPCON) will provide an additional measure of detecting non-participating aircraft. Again, lights-out

operations will be immediately restricted when a non-participating aircraft enters the MOA.

- Notifying Air Traffic Control facilities on activation and termination of lights-out operations will ensure that ATC is aware of the activities in the MOA and enables the controller to de-conflict the surrounding airspace.

In addition to ensuring that the rights of non-participating aircraft are protected, the inherent advantages of NVD technology (as outlined below) will exponentially increase the distances at which a pilot equipped with NVGs can detect a conventionally lit aircraft. This increase in visual detection range combined with the resultant effect of the above measures will ensure that lights-out activities are halted well before non-participating aircraft would normally visually acquire a conventionally lit aircraft.

NVD technology affords an unequivocal visual advantage versus normal night sight, so much so that aircraft with conventional external lighting will be visible at extended ranges depending upon conditions. Night vision device capabilities, coupled with on-board systems, optimize situational awareness provided to today's combat pilots. This far exceeds the visual assumptions under which 14 CFR Part 91 Section 113, *See and Avoid*, is currently structured. Moreover, the use of NVDs greatly enhances not only the situational awareness of the individual using the devices, but increases the overall safety of all aircraft (to include non-participating aircraft) in the area of NVD usage. NVDs significantly increase (5-10 fold) the level of night VFR safety associated with not only the individual users of the devices, but to all participants and non-participants within the view of anyone equipped with NVGs. Additionally, NVGs increase a pilot's "outside the cockpit" visual scan rate. The increased visual cues associated with NVD usage maximize situational awareness while enhancing navigation, maneuverability, multi-ship operations, and the ability to detect aircraft with non-compatible Night Vision Imaging System (NVIS) exterior lighting. Of significance, here is detection. The sensitivity of NVDs allows detection of aircraft with non-compatible exterior lighting at vastly greater distances than during day VFR flight. This sensitivity is due in part to the inherent characteristics of NVDs responding to a greater range of available energy, harnessing that available energy, and then intensifying it.

c) *Will MOA access be lost?* This exemption will not in any way change the overall usage of MOAs by the Navy or limit access to these MOAs. The Navy wants to ensure that any question regarding access to MOAs is addressed using accurate information. The average total number of sorties flown per 24 hour period is projected to remain the same. Of that total number, approximately one third will be night sorties and only a proportion of that amount are projected to be lights-out. What this bears out is that night sortie occurrence is limited in scope to the overall usage of MOAs in general and will not limit any constituency access to MOAs now, or in the foreseeable future. Additionally, per the reasons stated above, we believe that access to MOAs will be with a greater margin of safety than we now currently have.

All users, FAA, DoD, and General Aviation, share the responsibility of safety in the NAS. Naval Aviation shares this concern and remains confident through cooperation and risk management a successful resolution for all can be reached. This exemption has a far-reaching impact on our ability to train effectively in our nation's defense. Thank you for consideration of this petition based on the merits of safety, standards, and precedent. Please direct comments to

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MOA

Able

Carson

Churchill

Dome

Fallon

Kane

Lemoore

Ranch

Quail